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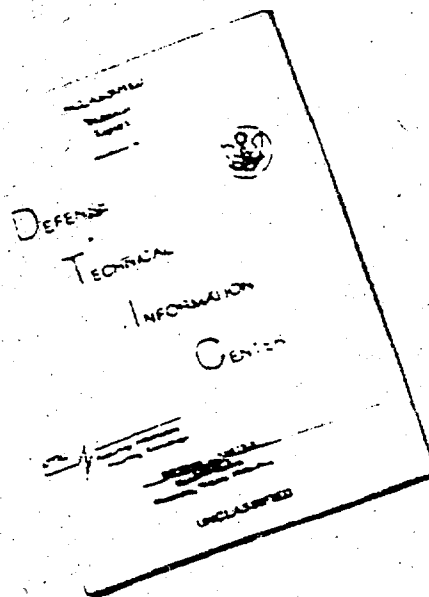
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# Light Armor In Deep Operational Maneuver: The New Excalibur?

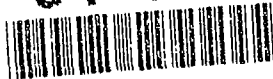
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by

Major Alan M. Mosher

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## ABSTRACT

**LIGHT ARMOR IN DEEP OPERATIONAL MANEUVER: THE NEW EXCALIBUR?** by MAJ Alan M. Mosher, USA, 68 pages.

This monograph discusses how the U.S. Army can successfully use light armor in deep operational maneuver at the corps level. Recent operations in the Persian Gulf during Operation Desert Storm emphasized the need for deep operations. New light armored vehicles, the creation of additional light armored units, existing regional armored threats, and the doctrinal need for high speed armored forces with deep operational capability will force the U.S. Army to examine how to successfully use light armor in deep operations. The study focuses on three areas: (1) how to organize light armored forces for deep operations, (2) the objectives of light armored forces in deep operations, and (3) the forms of maneuver used by light armored forces in deep operations.

This monograph first examines the theoretical use of light armor in deep operational maneuver. The theory section discusses the works of J.F.C. Fuller, M.N. Tukhachevsky, V.K. Triandafillov, G.S. Isserson, and Heinz Guderian. Next, the study examines three historical examples of light armor in deep operational maneuver. The three operations are the Kiev Operation (1920), the Khalkhin Gol campaign (1939), and Operation Bagration (1944). The study then analyzes the theoretical and historical use of light armor in deep operational maneuver.

This monograph reaches three conclusions. First, the light armored force organization for deep operational maneuver should be a combined arms force similar to the Soviet cavalry mechanized group (CMG). The light armor based CMG could serve as a model for the U.S. Army's mobile strike force (MSF) concept. The composition of the MSF would consist of a light armored cavalry regiment, two light armored brigades, an aviation brigade, and a combat support brigade. Second, a light armored MSF would be effective against deep operational objectives. The light armored MSF would be extremely effective against the enemy command and control structure, lines of communication, logistics assets, artillery, and operational reserves. Light armored forces would also have the ability to seize key terrain. Lastly, a light armored MSF can conduct envelopments, turning movements, infiltrations, and limited penetrations. Light armor can not conduct frontal attacks or penetrations against a coherent defense.

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## Section 1 - Introduction

King Arthur waged a mighty battle against a powerful knight. There were many great strokes and much blood. At last they smote together so strongly that Arthur's sword broke in two pieces. Arthur only prevailed with Merlin's help. Arthur beseeched Merlin that he had no sword with which to enter the next battle. They then rode in search of a new Excalibur.

Sir Thomas Malory<sup>1</sup>

Deep operational ground maneuver is of vital importance to the U.S. Army today. Recent operations in the Persian Gulf during Operation Desert Storm emphasized the need for deep operations. New light armored vehicles, the creation of additional light armored units, existing regional armored threats, and the doctrinal need for high speed armored forces with deep operational capability will force the U.S. Army to examine how to use light armor in deep operations. The first units to deploy in future contingency operations will probably include light armored forces.

The U.S. Army recognized the need for a new light tank to support rapid deployment forces since the late 1970's.<sup>2</sup> The U.S. Army delayed the start of a light armor program due to budget constraints and the priority of other weapons programs during the 1970's and 1980's. The lack of an effective light armor capability was evident during Operation Just Cause in 1989 and during Operation Desert Shield in 1990. The combat deployment of the M-551A1 Sheridan to Panama demonstrated that the

light armor problem was worse in wartime practice than in peacetime theory.' During Desert Shield, U.S. Army light contingency forces were vulnerable to armored attack prior to the arrival of U.S. heavy forces. Desert Shield reinforced the need for a strategically deployable and operationally capable replacement for the Sheridan. There is currently one light armor battalion of Sheridans assigned to the 82nd Airborne Division.

The aging Sheridan first saw action during the Vietnam War. These vehicles are difficult to maintain, the armor is too light to defeat modern anti-tank weapons, and the Sheridan's 152mm missile system has insufficient range and a long time of flight.' The Sheridan's future replacement will be the M-8 Light Tank.'

The M-8 light tank will be air deployable in the C-130, C-141, C-17, and the C-5A. The vehicle has three armor package levels of protection which range from 17.8 tons to 24.8 tons for ballistic protection up to 30mm size projectiles. The M-8 relies on speed and agility to fight tanks.

The M-8 has a modern fire control system. The M-8 has thermal acquisition capability and laser ranging. The main armament is a 105mm M68A gun with an inverted breech and a soft recoil mount. The M68A gun has a

twenty-one round auto loader with nine additional stowed rounds on board.<sup>6</sup> The 105mm M68A is a very effective weapon. Tanks using the M68A have successfully destroyed T-72's at ranges up to 3500 meters.<sup>7</sup> Secondary armament is a coaxial mounted 7.62mm machine gun. The M-8 has grenade launched smoke capability and a Nuclear - Biological - Chemical overpressurized system. With a fuel efficiency of two miles per gallon, it can travel more than twice as far as the M-1A1 on the same amount of fuel.<sup>8</sup> The U.S. Army will start fielding the M-8 in 1997.

The U.S. Army will field the first M-8 battalion with the 82nd Airborne Division. The Army plans to field two additional battalion size organizations with light divisions or in a corps organization.<sup>9</sup> The light armor battalion will have fifty-eight M-8s but will not have a mortar or scout platoon (See Appendix A).<sup>10</sup> Light armor will also be part of the light armored cavalry regiment.

The 2d Armored Cavalry Regiment (2ACR) will transition to the M-8 in 1999. Currently, the 2ACR is a very light HMMWV based organization. In 1999 2ACR will have one hundred and fourteen M-8s, one hundred and eighty M-113A3 armored personnel carriers, and twenty-four Paladin 155mm howitzers (See Appendix B).<sup>11</sup> The light armor in these new units may face a

significant armored threat in the future.

There are serious regional armored threats that could face U.S. forces in future operations. There are twenty-eight countries with more than one thousand main battle tanks.<sup>12</sup> Half of these countries pose a potential threat to U.S. interests. There are ten Middle East countries that have at least five hundred tanks and other modern weapons.<sup>13</sup> Numerous developing nations can field multi-battalion size armored and mechanized forces.<sup>14</sup> These potential threats highlight the need for high speed armored forces with deep operational capability.

FM 100-5, Operations stresses the need for effective application of firepower and maneuver in deep operations. High speed armor forces as part of a combined arms organization, give the operational commander the capability to destroy enemy forces in depth.<sup>15</sup> Both FM 100-5 and FM 17-18, Light Armor Operations state that light armored units will conduct standard armor operations.<sup>16</sup> Fast light armored forces may have to form a part of the combined arms team in deep operational maneuver.

There are several reasons for considering the use of light armor in deep operations. Due to unforeseen operational requirements, limited logistical capability, shortage of heavy forces, and the impact of

force reductions, light armored forces may be the operational commanders best or only deep ground maneuver asset. After the arrival of heavy forces, light armor may have an operational role in addition to its tactical roles of security, reconnaissance, and anti-armor fires.<sup>17</sup> Light armor's strengths of speed, mobility, firepower, and agility enable it to seek decisive results in the enemy's rear and flank areas.<sup>18</sup> Also, the U.S. Army is examining the composition and capability of a mobile strike force in deep operational maneuver. Light armor could be the key to solving the problem of the Army's new strike force concept. It is clear that light armored forces will have the opportunity to play a deep operational maneuver role in the future.

This monograph examines the question: How can the U.S. Army successfully use light armor in deep operational maneuver at the corps level? This study will reveal a solid theoretical basis for the use of light armor in deep operations. The study also examines the successful use of light armored forces in operational maneuver through selected historical examples. The areas examined are: (1) how to organize light armored forces for deep operations, (2) the objectives of light armored forces in deep operations, and (3) the forms of maneuver used by light armored

forces in deep operations.

This study is arranged in four sections. Section two presents the theoretical use of light armor in deep operational maneuver. The theory section will discuss the works of J.F.C. Fuller, M.N. Tukhachevsky, V.K. Triandafillov, G.S. Isserson, and Heinz Guderian. Section three examines three historical examples of light armored forces in deep operations. These examples are the Kiev operation in July and August 1920 during the Polish - Soviet War, the Khalkhin Gol campaign from May to September 1939 during the Russo - Japanese Border War, and the Belorussian campaign in June and July 1944 during the Russo - German War. Section four is an analysis and synthesis of the theoretical and historical use of light armor in deep operations. The final section presents findings and conclusions.

It is necessary to define the key terms used in this study. In this monograph the definition of light armor refers to wheeled or tracked armored vehicles that weigh less than or equal to thirty tons and have armament systems designed for direct fire support. FM 100-5, Operations states that deep operations are,

those operations directed against enemy forces and functions beyond the close battle. They are executed at all levels with fires, maneuver, and leadership. Deep operations affect the enemy through either attack or threat of attack. They expand the



battlefield in space and time to the full extent of friendly capabilities. Effective deep operations facilitate overall mission success, enhance protection of the force, and set the conditions for decisive future operations.<sup>19</sup>

In this study maneuver is, "movement relative to the enemy to put him at a disadvantage."<sup>20</sup>

## Section 2 - Theoretical Use of Light Armor in Deep Operational Maneuver

The use of light armor in deep operations had its beginnings in World War I. The search to break the stalemate of the trenches led to the development of armored fighting vehicles. There were five theorists who envisioned the use of light armor to fight throughout the depth of the battlefield. These theorists were J.F.C. Fuller, M.N. Tukhachevsky, V.K. Triandafillov, G.S. Isserson, and Heinz Guderian. They all believed that fast long range light armored vehicles were needed for deep operational maneuver in order to win in the next war. Fuller's lectures and writings were a catalyst for thoughts on how to use armored forces.

J.F.C. Fuller was an advocate of the use of armored and mechanized forces to wage maneuver warfare. His ideas were greatly affected by his experience in World War I and later by the Polish - Soviet War in 1919 and 1920.<sup>21</sup> He developed a mechanized warfare theory that included deep operations, an organization based on the

tank, and the use of light tanks in deep operational maneuver.

Fuller realized during World War I the potential of armored forces. Fuller produced a plan known as "Plan 1919" before the war ended. Fuller's plan had two elements; a combined arms attack on troops along the main front, and a force of fast moving light tanks that penetrated the enemy's defense and attacked command and control (C2) assets in the enemy rear area. This was the basic principle behind all following deep attack concepts.<sup>23</sup> After World War I Fuller continued to develop his ideas.

Fuller developed an organization that included an anti-tank force for protective power and a tank force for offensive power.<sup>23</sup> The tank force consisted of different types of tanks for different functions on the battlefield. There were three categories of tank which included reconnaissance, artillery, and combat.

Reconnaissance tanks were light and were for close or long range scouting. Artillery tanks consisted of self propelled artillery and an infantry close support vehicle with a semi-automatic gun. The combat tanks were also of two types. The first was a medium tank with heavy armor for the close fight and the other was a light tank for deep pursuit.<sup>24</sup> Fuller envisioned the pursuit tank as being similar to the long range

reconnaissance tank.<sup>25</sup> These different vehicle types were needed to attack the related objectives and decisive points Fuller deemed necessary to achieve victory against an enemy army.

Fuller felt that the main decisive point on the battlefield was the enemy C2 structure. By attacking enemy C2, logistics, and lines of operation, Fuller believed he could cause the enemy to change his plan and ultimately break the will of the commander.<sup>26</sup> The C2 decisive point was in the enemy rear.

Fuller believed that the focus of all effort should be in the enemy rear area. Mechanized cavalry in armored cars or light tanks would conduct deep reconnaissance in conjunction with airplanes. Medium tanks and infantry would create a penetration. Anti-tank forces were held in reserve or moved to the flanks to protect against enemy tanks. Light armor would then exploit through the penetration created by the heavier tanks into the enemy rear area (See Appendix C).<sup>27</sup>

Light armor was necessary to gain the synergistic effect Fuller was seeking. Light tanks could conduct deep reconnaissance to identify key C2 decisive points in the enemy rear. During pursuit and exploitation operations, fast light armored forces could penetrate in depth to destroy and threaten C2 assets identified by reconnaissance forces. Additionally, light armor

could operate at greater ranges due to a requirement for less fuel in comparison to heavier forces. The light tank was a key component of Fuller's deep operational thinking. During the 1920's, Fuller's ideas on long range penetration focused on the use of the light tank whereas the Soviets initially thought in terms of light cavalry. The Soviet theorists later considered light tanks during the 1930's because of the chemical weapons threat to horse cavalry.

The first of these Soviet thinkers was M.N. Tukhachevsky. He was the leader of a generation of Soviet theorists that formulated the concept of deep battle and deep operations. Tukhachevsky developed his concepts from World War I, his experience as commander of the Caucasus Front during the Polish - Soviet War, and from an interchange of ideas with foreign military theorists.<sup>28</sup> Tukhachevsky went beyond Fuller's tanks only theory. Tukhachevsky's theory envisioned deep operations using combined arms, an organization that included an operational role for airpower, and also used light armor in a deep operational role.

Tukhachevsky's experience made him realize that he could use the emerging technology of the tank and the airplane to execute maneuver warfare throughout the depth of the battlefield. He needed operational maneuver forces to prevent the formation of solid

fronts. He would use highly mobile forces to out flank the enemy and penetrate into rear areas to disrupt and prevent deployment of enemy forces. If he could not exploit a flank, he would create one by breaking through and exploiting into the enemy's operational rear area.<sup>29</sup>

The focal point of Tukhachevsky's thinking was the all arms battle and the principle of simultaneity. Simultaneity meant bringing the largest number of troops into contact at the same time. He would create a broad front thereby pinning down the enemy. He would then conduct a penetration at a chosen point and launch a mobile force with air support deep into the operational rear area.<sup>30</sup> He would also consider the deep employment of airborne forces. The mobile, air, and airborne forces would disrupt the enemy C2 system, destroy logistical assets, cut lines of communication (LOC's), and pin down and isolate reserves.<sup>31</sup>

Tukhachevsky's attacking force consisted of a holding force, a breakthrough force, and a mobile force. All forces were combined arms and had armored forces. The holding force was predominately infantry with medium tank support. The breakthrough force was infantry, mechanized infantry, and medium tanks. The breakthrough force created the penetration and defeated tactical reserves. The mobile force contained light

tanks and tankettes in mechanized and cavalry units. The mobile force would strike deep into the operational rear area (See Appendix D).<sup>32</sup>

Tukhachevsky's concept of deep operational maneuver gave light armor the key role in the enemy's rear area. Light tanks with high speed, long range capability, and equipped with guns must be able to destroy artillery, ruin logistical assets, cut communications, capture enemy headquarters, and most importantly isolate operational reserves. "The deep penetration by light armor must create an obstacle for the enemy onto which he is forced back on and destroyed."<sup>33</sup> V.K.

Triandafillov, a subordinate of Tukhachevsky, would expand Tukhachevsky's theories and provide specific ideas that Tukhachevsky would later use to build the Soviet mechanized force of the early 1930's.

Richard Simpkin described Triandafillov as the "father of Soviet mechanized warfare."<sup>34</sup> Triandafillov was a Soviet theorist who also analyzed the nature of the Russian defeat in World War I, the Russian Civil War, and the Polish - Soviet War. He came under the intellectual instruction of Tukhachevsky in the early 1920's.<sup>35</sup> Triandafillov's theory of deep operations and the use of light armor was very similar to Tukhachevsky's.

The composition of Triandafillov's proposed force

for deep operations consisted of an all arms mechanized tank force. These all arms formations would attack in two phases. In the first phase, tank and mechanized forces would attack a small portion of the enemy front. The first phase attack would extend into the tactical depth of the enemy with high tempo and high risk to achieve simultaneity. In the second phase, independent mobile groups spearheaded by tanks, aircraft, airborne, and combined arms forces supported by engineers would attack into the operational depth (See Appendix E).<sup>36</sup> The first phase would have heavy breakthrough tanks for close support of infantry. In the second phase, the independent mobile force would contain light maneuver tanks and mechanized cavalry that could withstand artillery fire. To support this concept, Triandafillov envisioned three types of tanks.

Triandafillov divided tanks into three groups according to range of action. The three groups included close direct infantry support (NPP), infantry fire support (DPP), and long range penetration (DD).<sup>37</sup> The long range penetration tanks in cooperation with long range artillery and aircraft, would penetrate in various depths to attack artillery, C2, headquarters, and deny the withdrawal of enemy reserves in the operational rear area.<sup>38</sup> Triandafillov also had specific roles for light armored cavalry forces within

the mobile group.

Light armored cavalry could accomplish operational reconnaissance and pursuit missions as part of mechanized cavalry mobile groups. Light tanks could facilitate the cavalry's penetration and evaluation throughout the depth of the enemy disposition. Light armor could also assist cavalry in the pursuit by surmounting resistance of retreating enemy covering units.<sup>39</sup> Triandafillov determined that the light tank would need specific characteristics to be effective in deep maneuver.

The maneuver or light long range tanks would weigh up to twelve tons, have a speed of forty kilometers per hour, a range of three hundred kilometers, and a fuel supply of twelve hours. The light tanks would have two to three days of logistics support on trucks within the corps. The column length within the corps would be fifty kilometers. The mobile force would have three regiments with a total of two hundred tanks.<sup>40</sup>

Triandafillov believed that new, more mobile, and faster longer range light tanks must replace the slower short range heavy tanks.<sup>41</sup> Only light tanks could meet the demands required of the combined arms mobile force. The mobile force needed speed and long range capability in order to achieve operational objectives,



simultaneity, and the ultimate defeat of the enemy force. Triandafillov's ability to impact on the theory of deep operations and the use of light armor was brief.

Triandafillov died on 12 June 1931 in a plane crash. Triandafillov's death coupled with Joseph Stalin's Red Army officer purges in the late 1930s eliminated most of the expertise in deep operational maneuver. Stalin executed Tukhachevsky on 11 June 1937 during the period of the purges.<sup>43</sup> A third Soviet theorist, G.S. Isserson, somehow escaped the purges and probably exerted the most enduring Soviet influence in the use of light armor in deep operational theory.

Isserson was the third member of the Soviet creative triumvirate. He coordinated and edited Soviet Field Service Regulation 1936 (PU 36).<sup>44</sup> The focus of PU 36 was mainly tactical. However, PU 36 contained the building blocks for Soviet doctrine on deep operations and the use of light armor. Isserson continued to promote the concept of deep operations in the form of PU 36 after Tukhachevsky's death. Isserson stressed the role of light fast moving armored units in the deep operational penetration of the enemy's rear area.<sup>45</sup> Following Tukhachevsky's and Triandafillov's lead, Isserson's deep operational theory contained echeloned formations, independent mechanized cavalry

units, and six deep operational variants for the use of light armor.

Isserson's deep operation had two echelons. The first echelon was the attack echelon. The attack echelon was an all arms formation reinforced with artillery and tanks. This echelon would defeat the defensive on a narrow front, create a penetration, and then defeat the tactical reserves in depth. The second echelon, the development echelon, contained highly mobile mechanized and cavalry units tasked to extend the tactical breach into operational depth. The development echelon had light armor equipped mechanized and cavalry units, motorized, airborne, and aviation units organized to cooperate together but to operate independently of the main force (See Appendix F).<sup>45</sup> Once the mechanized cavalry mobile force fulfilled its mission in operational depth, following combined arms units replaced the mobile force. The commander would then place the mobile force in the rear of the main body until the next operational blow was struck.<sup>46</sup>

Isserson defined the characteristics of the independent mobile force. The mobile force should have different characteristics from the attack echelon. The mobile force must have fast mechanized and cavalry units only, it must be long range, and it must be sustainable.<sup>47</sup> The force must have light tanks with

high cross country mobility, the ability to defeat bullets and artillery, and have long range capability. The formation composition could change, but it would usually have mechanized and cavalry units on the ground and aviation and airborne assault detachments in the air employed in operational depth.<sup>49</sup> There were several conditions in which to best employ the mobile force.

Isserson had six variants in which a light armor equipped mobile force could best develop an operational penetration in depth. In the first variant, the commander committed the mobile force early. In this case the enemy was weak, there were no enemy reserves, or the mobile force could penetrate an exposed flank or infiltrate between unguarded enemy unit boundaries. The second variant was the most common in which the commander committed the mobile force after the attack echelon penetrated the tactical depth of the defence. The third variant was the most complex. In a strongly fortified zone, the mobile force would have to finish the defeat of the tactical reserves. That method was least desirable because the mobile force would weaken itself before completing the operational mission in depth.<sup>50</sup> The last three variants were forms of maneuver that took place once the commander committed the mobile force into operational depth.

In the fourth variant, the enemy lacked significant

operational reserves. In this case only a small mobile force moved into the operational rear to destroy C2, headquarters, logistics, or to seize a key piece of terrain. The fifth variant employed a strong mobile strike force to destroy the operational reserve or to block the rear of the operational reserve. In the last variant, the operational mobile force combined with an adjacent friendly unit to encircle and destroy large enemy forces in operational depth.<sup>30</sup> In the last two variants, elements from the attack echelon continue to move toward the mobile force and pin the enemy against the mobile force. The operational variants described the conditions under which a commander could successfully use light armor in deep operational maneuver.

Isserson's theory on the deep operational use of light armor was consistent with Tukhachevsky's and Triandafillov's theories. Isserson continued to promote deep operational theory and expanded the ideas of his predecessors in the areas of echeloned formations, independent mechanized cavalry units, and the six deep operational variants for the use of light armor. Isserson also shared ideas during the extensive Soviet and German collaboration during the interwar years. Isserson claimed that the Germans copied the Soviet outline for deep operations approved in 1932 and

1933.<sup>51</sup> Heinz Guderian's thoughts on deep operational maneuver and the use of light armor were similar to the theory adopted by the Soviets.

Although many other theorists in other nations echoed the ideas expressed by Guderian, he was the first to create and master combined arms mechanized warfare in deep operations. He developed a deep operational theory supported by the notion of an all arms division composed of mostly light tanks.

Guderian's theory had five phases in the attack. He would launch the assault on a wide front and in depth to prevent the enemy from striking the spearhead of the penetration in the flank. Once the penetration was made of the front line defense, the second phase would start. Armored forces would pin down enemy tactical reserves and C2 in the second phase. In the third phase a second line of armored forces would destroy enemy artillery and anti-tank forces. In the fourth phase a third line of armored forces with infantry would be brought up to widen the penetration and secure passage of supporting elements. In the fifth phase, an armored reserve would encircle intact sectors of the front or continue the attack into operational depth to destroy C2, tank and anti-tank reserves, artillery and logistical assets.<sup>52</sup>

The armored force would drive deep into the enemy

rear to achieve surprise, prevent the reserves from going into action, and convert tactical gains into operational ones.<sup>53</sup> The attack in depth against enemy artillery was done primarily with friendly artillery and airpower. Airpower supported the tactical and operational phases of the attack (See Appendix G).<sup>54</sup> Supporting arms for the armor within each panzer division were vitally necessary for a successful armored attack.

Guderian felt that a panzer division of combined arms forces must have supporting elements with the same mobility as tanks. Tanks could only succeed if employed with other weapons with the same standard of speed and cross country performance.<sup>55</sup> Armored divisions needed to include all the supporting arms of combat and combat service support to enable the tanks to fight with full effect.

In his book Achtung - Panzer!, Guderian initially perceived the need for three categories of tanks. He proposed heavy tanks to reduce fortresses and field fortifications, medium tanks for infantry support, and light tanks to exploit penetrations. The light tanks would need great range and speed to execute deep breakthroughs. Light tanks in a combined arms force would attack enemy C2, tank and anti-tank reserves, and artillery in tactical and operational depth.<sup>56</sup>

When he created the panzer force, Guderian had to settle for the smaller solution of lighter, faster, and cheaper machines. The initial equipment for the panzer divisions consisted of three complementary types of tank. None of the first mass produced German tanks equalled the heavily armored and armed French tanks of the period. The Panzer Mark II was a light reconnaissance tank, the Panzer Mark III was a light fifteen ton tank, and the medium Panzer Mark IV was for infantry direct fire support. The Mark III was the back bone of the panzer force. It was a tank killer designed for a deep operational maneuver role.<sup>97</sup>

Guderian was the first to create and master combined arms mechanized warfare in deep operations. He developed a deep operational theory that contained airpower, an all arms division, and panzer divisions composed mostly of light armor. He validated his theory in Poland (1939), France (1940), and during the initial stages of the attack during Operation Barbarossa (1941). Guderian's principle shortcoming was that he lacked an understanding of operational art. This lack of understanding prevented him from putting deep operations in the proper creative context.

All of the theorists examined in this section conceived a deep operational theory which included the use of light armor. They all believed that there was a

need for fast long range light armored vehicles to conduct successful deep operational maneuver. The next portion of the study will examine the historical use of light armor in deep operational maneuver.

### Section 3 - Historical Use of Light Armor in Deep Operational Maneuver

This section examines three examples of light armor in deep operational maneuver. These examples are instructive for several reasons. Each operation illustrates how to organize light armored forces for deep operations. The operations also demonstrate the objectives and forms of maneuver that light armored forces used to be successful in deep operational maneuver.

#### 1st Cavalry Army in the Kiev Operation During the Polish - Soviet War, 1920

The Kiev Operation took place from 26 May to 13 June 1920. The operation was in response to the Polish invasion of Soviet territory on 25 April and the subsequent capture of Kiev on 7 May. The Soviet command wanted to encircle and destroy the 78,000 Poles in the Polish 3rd Army around Kiev and the 6th Army around Vinnitsa.<sup>50</sup> S.M. Budenny's 1st Cavalry Army (1st CA) played the most important role in the initial breakthrough and encirclement of the Polish forces.



The 1st CA was the most successful innovation of the Polish - Soviet War and Russian Civil War period.<sup>89</sup> Budenny organized the 1st CA as a combined arms mobile strike force. The 1st CA had four cavalry divisions, two infantry divisions, an armored car battalion, an air group of twelve planes, five armored trains, fifty-two pieces of artillery, three hundred and fifty machine guns, and a total of 18,000 men.<sup>90</sup> The airplanes and advanced guard cavalry provided reconnaissance for the advancing divisions. A mobile force created a penetration with a combination of massed infantry, dismounted cavalry, and machine guns well forward. Concentrated mounted cavalry and the armored car battalion completed the tactical penetration and broke through into the tactical and operational rear of the enemy. The artillery and armored trains supported the attack.<sup>91</sup> With this same organization, Budenny would penetrate the Polish front and break into the Polish operational rear area.

1st CA launched the attack on 5 June. Budenny's reconnaissance had found the boundary between the Polish 2nd and 3rd Armies. The Polish defenses consisted of only two battalions in the area of the boundary. Budenny massed his force and attacked along the boundary to effect a tactical and operational penetration by combining the maneuvers of penetration,

infiltration, and envelopment of flanks. After a brief artillery barrage, infantry and dismounted cavalry attacked followed by the massed cavalry and armored cars. Three cavalry divisions and the armored cars overran the Polish positions and by the end of the first day, 1st CA had broken through to rear of the Polish tactical defence on a sector twelve kilometers wide.<sup>42</sup>

Budenny had several objectives in the Polish rear area. Initially the 1st CA was to move towards Kiev, envelope the Polish 3rd Army, and attack the 3rd Army from the rear. On the second and third days, Budenny diverged from his mission and advanced towards Zhitomir. He cut the rear communications of the Polish Army group Kiev and captured the centers of communication at Fastov, Berdichev, and Zhitomir. He also destroyed railroad lines, marshaling yards, highways, bridges, telephone lines, and supply warehouses (See Appendix H).<sup>43</sup> Most importantly, 1st CA's attack had a severe psychological effect on the Polish forces and the Polish commanders.

Violent panic broke out in the Polish rear area and the Polish Armies retreated. The Polish 3rd Army eventually escaped encirclement after Budenny was given conflicting messages from the Soviet Western Front and also disobeyed orders from his higher headquarters.

The 1st CA breakthrough and deep operation helped to repulse the Polish invasion and started a general advance of Soviet forces that lasted for ten weeks."

The 1st CA had made an operational penetration through three Polish armies four hundred miles deep and fifty miles wide." Budenny's forces took one thousand prisoners and killed eight thousand." Polish forces seemed to avoid the 1st CA during the remainder of the operation.

Within six weeks 1st CA took the Polish army commander's headquarters at Rovno and crossed the Zbruch river in the direction of Lwow. The 1st CA then began a turning movement north at the extreme western edge of the Pripet Marshes. The 1st CA advance ended at the Pripet due to a lack of momentum, casualties, weak horses, and overextended logistics."

The 1st CA's deep operational maneuver was an excellent example of how to organize a mobile force, how to use cavalry and light armor in deep operational maneuver, and the use of combined arms. It also demonstrated the successful operational effects on objectives such as lines of communication, logistics assets, and the rear of the enemy army. Additionally, cavalry and light armor were able to exploit unit boundaries, penetrate weak resistance, infiltrate gaps, and envelope flanks in order to get into the enemy

operational rear area.

The 1st CA Kiev Operation demonstrated to the theorists the potential of replacing horse cavalry with light armored vehicles. The operation also gave insight as to what the 1st CA could have achieved with swift destructive terrain crossing armored vehicles in cooperation with aircraft on the 1st CA model.<sup>46</sup> The Khalkhin Gol campaign would be the first campaign to realize the possibilities of using a totally mechanized light armored equipped force in deep operational maneuver.

The Khalkhin Gol Campaign During the Soviet - Japanese  
Border War, 1939

The Khalkhin Gol campaign took place from 11 May to 15 September 1939. The Imperial Japanese Army (IJA) attacked Soviet allied Mongolian cavalry troops that wandered into the disputed area of the Mongolian and Manchurian border.<sup>47</sup> Soviet and IJA border troops fought along the border while both sides brought forward additional troops. Leading the reinforcing Soviet forces was a past member of 1st CA under Budenny and future marshal and hero of World War II, G.K. Zhukov.

Zhukov's force organization reflected the efforts of Tukhachevsky, Triandafillov, and Isserson as written in the Soviet doctrine PU 36.<sup>48</sup> The mechanized and

armored forces contained armored cars and light tanks. Zhukov task organized his army into three groups. The northern group contained the 6th Mongolian Cavalry Division, the 7th Mechanized and 11th Tank Brigades, the 82nd Field Artillery Regiment, and the 87th Anti-tank Brigade. The center group consisted of the 82nd Rifle Division, the 36th Motorized Division, and the 5th Rifle - Infantry Brigade. The southern group had the 57th Rifle Division, the 8th Cavalry Division, the 8th Motorized, 6th Tank, and 11th Tank Brigades, the 1/185th Artillery Regiment, and the 37th Anti-tank brigade. In reserve were the 212th Airborne Brigade, the 4th Battalion of the 6th Tank Brigade, and the 9th Motorized Brigade. The Soviets had four hundred and ninety-eight light tanks, three hundred and forty-six armored cars, and five hundred and eighty-one airplanes matched against the IJA's one hundred and eighty tanks and four hundred and fifty airplanes." There were three engagements during the campaign.

The Soviets conducted two preliminary engagements prior to the major contest of 20 - 31 August.

From the 22nd to the 26th of June, a sustained air battle took place in which the Soviets achieved superiority in the skies. On 3 July, a three day engagement began when IJA forces launched an attack to seize high ground to the west of the Khalkhin Gol river. Soviet forces launched a counterattack with tank and mechanized formations and forced the IJA back across the river."

The Soviets then continued to mass forces and conducted extensive ground and air reconnaissance prior to the decisive engagement. Because of the detailed reconnaissance effort, Zhukov knew the IJA did not have well organized mechanized forces, massed tanks in major tank groups, nor operational reserves.<sup>73</sup> Good intelligence helped Zhukov formulate his plan and set the stage for success.

The third and final engagement started on 20 August. One hundred and fifty Soviet bombers attacked IJA positions and lines of communication. Zhukov used his center group to pin down as many IJA forces as possible to prevent the IJA from reinforcing its flanks. The northern group had to conduct a penetration, exploit the breakthrough with mechanized light armored forces, and then envelope the IJA units from the north. Zhukov concentrated over three hundred and twenty light tanks and the armored car brigade (8th Mechanized) with the southern group. The southern group overcame light resistance and easily outflanked the IJA position. The southern group then conducted an envelopment from the south to link up with the northern group in the rear of the IJA (See Appendix I).<sup>74</sup>

On 23 August, Soviet forces completed the encirclement. For five days the IJA tried to break the encirclement through counterattacks from inside and

outside the ring without success. On 28 August, Japanese resistance ended allowing the Soviets to reestablish the frontier by 31 August. Soviet and IJA forces concluded a cease fire agreement on 15 September ending the Khaikhin Gol campaign.<sup>75</sup>

The Khaikhin Gol campaign was an excellent example of how to successfully conduct deep operational maneuver with light armored forces. Light armored forces were a powerful means of conducting offensive operations at high tempo and at great depth to achieve the operational objective of severing enemy lines of communication and withdrawal.<sup>76</sup> The operation also demonstrated the need to organize mobile forces for joint combined arms operations. Additionally, light armor was also successful in several forms of maneuver.

Light armored formations rapidly sought flanks, exploited penetrations, avoided heavy resistance, and executed envelopments. Soviet forces blocked the path of retreat of the 6th IJA by positioning light armored forces at the rear of the enemy army. The IJA impaled itself on the light armored units and was ultimately destroyed. Zhukov successfully employed multiple small light armored and mechanized brigades rather than large corps at Khaikhin Gol.<sup>77</sup> Five years later, light armored forces would be the spearhead for large corps and army organizations.

Operation Bagration. The Belorussian Campaign During  
The Russo - German War, 1944

Operation Bagration took place from 22 June to 13 July 1944. The operation marked a successful progression in the use of deep operational maneuver during the Russo - German War since the first effective use of mobile groups during the battle of Stalingrad.<sup>78</sup> The Soviets had briefly discarded PU 36 and disbanded the tank and mechanized divisions after the purge of the officer corps in the late 1930's.

The Khalkhin Gol campaign and German successes between 1939 and 1941 caused the Soviets to reorganize the tank and mechanized forces in accordance with the doctrine of PU 36. The Soviets extensively used cavalry mechanized groups (CMG) as front mobile groups. The mobile groups used light armor during Bagration in an effort to rapidly negotiate the difficult terrain in the Belorussian area.<sup>79</sup>

Bagration was the first of three overlapping operations designed to destroy German Army forces on the western front in 1944. This operation was a clear example of the difference between the strategic, operational, and tactical levels of war. The Soviets determined each level by aim. The strategic aims for Bagration were to secure Belorussia and destroy German Army Group Center.<sup>80</sup> At the operational level, there



were operational phases that linked the strategic aims to the tactical level.

Bagration had four operational phases. The first phase objectives Vitebsk, Orsha, Mogilev, and Bobruysk were along key movement corridors. The second phase objectives were crossing sites on the Berezina River. The third phase objective was Minsk which was the key communications hub in Belorussia and where the Soviets expected to destroy the German operational reserves. The last phase objectives were the Molodechno Gap, Baranovichi Gap, and the city of Stolbtsy which were movement corridors containing rail lines and highways. The Soviets employed one hundred and sixty-six rifle divisions, eight tank or mechanized corps, and two cavalry corps on four fronts in the overall operation (See Appendix J).<sup>21</sup> This study will focus on the mobile force CMG operations on the 3rd Belorussian Front.

The 3rd Belorussian Front organized two mobile groups, the 5th Guards Tank Army (5GTA) and a CMG consisting of the 3rd Guards Cavalry and the 3rd Guards Mechanized Corps. The organization of the CMG was consistent with the operational combined arms doctrine in PU 36. The Soviets relied on the CMG and the 5GTA as the primary exploitation force. The CMG could traverse the difficult terrain in the area which was laced with bogs, swamps, wetlands, and dense forests.

The CMG contained mostly light armored forces made up of T-70 and T-80 light tanks, some T-34 medium tanks, and horse cavalry.<sup>82</sup>

The attack started 22 June when assault groups attacked to penetrate the German front line defense. The 3rd Belorussian assault groups had seventy percent of the total number of rifle divisions and eighty percent of the available artillery to breakthrough the tactical defense along a narrow front. Using combined arms forces, the assault groups created a penetration and conducted a deep attack at the tactical level. The assault groups were able to break through in depths of between fourteen and fifty kilometers. Infantry forces then surrounded Vitebsk trapping four German divisions.<sup>83</sup> Once infantry forces completed the encirclement, the front commander launched the CMG to conduct deep operational maneuver.

On 24 June the CMG moved through the penetration created by the assault group. On 25 June the 5GTA followed the route of the CMG. The CMG and the 5GTA did not stop to form an outer ring of encirclement around Vitebsk but pushed on to the Berezina River.<sup>84</sup>

The CMG seized crossings over the Berezina and moved to the west towards Minsk. The CMG and the 5GTA did not concentrate on Minsk but rapidly moved northwest of Minsk to the Molodechno Gap virtually

unopposed. The mobile group cut the lines of communication from Vilnius to Minsk and helped to form an outer ring of encirclement around the German 4th Army which included the operational reserves committed between Minsk and the Berezina River. The trailing combined arms armies formed an inner ring of encirclement and captured Minsk by 8 July. Elements of the CMG and 5GTA then continued west to seize Vilnius.<sup>33</sup> Aircraft attacking in depth were instrumental in the success of the CMG.

Soviet airpower played a major role by gaining air superiority and covering the advance of the mobile groups. Soviet aircraft executed deep operational strikes against enemy artillery, enemy reinforcements, C2, and logistics assets. The airforce also assisted in the destruction of encircled forces.<sup>34</sup> Soviet air superiority extended throughout the deep operational area and helped to defeat the German forces by 13 July. The Germans were not able to stabilize the front until August.

The capture of Minsk sealed the fate of the German 4th Army. In twelve days Army Group Center lost sixty percent of its total strength which amounted to twenty-five divisions. The Soviets conducted a parallel and frontal pursuit operation over a distance of two hundred kilometers and destroyed a large enemy force.<sup>35</sup>

The use of combined arms with light armor in the CMG during Bagration enabled the Soviets to conduct successful deep operational maneuver. It was necessary for a heavy combined arms force to make a clean penetration for the CMG. The CMG could then rapidly maneuver deep against token forces in the enemy rear area. The CMG concept also needed air superiority for an effective joint effort and to protect the CMG in the enemys rear area.

The light armored equipped combined arms organization of the CMG made it extremely flexible and mobile. Light armored forces enabled the Soviets to rapidly cross difficult terrain. The light armored forces of the CMG were also effective in seizing operational objectives that included lines of communication, C2 centers, key pieces of terrain, and blocking positions that prevented the retreat of the enemy force. The form of maneuver that the CMG proved itself capable of conducting was the deep envelopment. The CMG concept worked extremely well when the Germans possessed few mobile reserves or were slow in reacting to the attack.

#### Section 4 - Analysis

##### Analysis of the Theoretical Use of Light Armor

There is a solid theoretical basis for the use of light armor in deep operational maneuver. All five

theorists examined in this study stated that light armor was an essential component of deep maneuver. There were three main areas of concern that each theorist considered for the successful use of light armor. These areas included: (1) how to organize light armored forces for deep operations, (2) the objectives of light armored forces in deep operations, and (3) the forms of maneuver used by light armored forces in deep operations.

Light armor must operate in a combined arms organization. Except for Fuller who advocated an all tank formation, each of the theorists envisioned combined arms formations. The Soviet theorists supported the use of all arms forces and mobile groups consisting of cavalry and mechanized units. Guderian's combined arms solution was the panzer division. Each light armored organization relied heavily on reconnaissance.

All the theorists felt that reconnaissance for the mobile force was essential for the success of deep operational maneuver. The mobile force must have a means of gathering and confirming intelligence in the enemy operational rear area. Each of the theorists used light armor and air assets to conduct reconnaissance. The need for combining a strong reconnaissance capability with an effective mobile

force led to the Soviet CMG and light armored reconnaissance in Guderian's panzer division. Although airpower was needed for reconnaissance, it was also needed for the effective employment of light armored mobile forces.

The light armored organization needed organic or joint cooperation with airpower. Airpower could enhance mobile operation effectiveness in the operational rear area. The Soviet theorists and Guderian envisioned the use of airpower against deep targets in conjunction with the mobile force. Airpower would also be able to gain air superiority and enable light armored forces to maneuver freely to achieve objectives in operational depth.

The theorists all agreed on the objectives of light armored mobile forces in deep operational maneuver. Light armored forces should attack the enemy C2 structure, LOCs, logistics assets, artillery, and operational reserves. Isserson also pointed out that light armored forces could seize terrain objectives. The seizure of key terrain objectives in the enemy operational rear could prevent the movement of reserves, prohibit the withdrawal of the main enemy force, or cause the enemy to change his plan. Ultimately the possession or the destruction of these objectives would destroy the morale and will of the

enemy army and commander. The light armored force could attain its objectives through several forms of maneuver.

The theorists realized that the light armored mobile force could not normally conduct successful penetrations or frontal attacks. A heavy combined arms force conducted the penetrating attack to create assailable flanks for light armored envelopment. Fast long range light armored mobile forces could then move into the operational depth of the enemy force. Mobile forces were then free to conduct a series of envelopments or other types of maneuver.

The mobile force could also conduct turning movements and use combinations of maneuvers. The mobile force could execute a turning movement by seizing key terrain in the enemy rear area. If the enemy defense was weak, had open flanks, or was in the process of forming, the mobile force could combine a series of maneuvers. The mobile force would use infiltrations and envelopments to gain entry into the enemy operational rear and to attack operational objectives. The historical examples in this study support the contentions of the theorists.

#### Analysis of the Historical Use of Light Armor

All three operations demonstrated the successful use of light armored forces in deep operational

maneuver. Each operation highlighted the organization, objectives, and forms of maneuver best suited to light armored forces. Light armored forces in each case were part of a combined arms force.

The organization in each historical example was a mixture of cavalry, armor mechanized, and air forces. The Soviet forces continuously evolved into the CMG concept. In all three operations light cavalry and light armored mechanized forces provided fast, long range, and logistically supportable forces deep into the enemy rear area. The Kiev operation demonstrated the need for improved logistical sustainment and additional light armor to replace the horse for added protection. Each operation demonstrated that a CMG could quickly exert operational pressure on the enemy once the CMG was clear of the main enemy defensive force.

The light armored force relied on a heavy combined arms force to create a penetration if there were no assailable flanks. In the Kiev operation, a combined arms force created a penetration. A concentrated cavalry and light armored force then completed the penetration and moved into the enemy operational rear. In the Soviet northern group at Khalkhin Gol and in Bagration, CMGs exploited penetrations created by a heavier combined arms force.



As part of the CMG, cavalry was essential for reconnaissance throughout the operational depth of the battlefield. During the Kiev and Khalkhin Gol operations, cavalry identified enemy boundaries, infiltration routes, open flanks, and facilitated rapid movement in the enemy rear area. In Bagration, the light armored cavalry rapidly guided light armored forces through difficult terrain. Air power also provided intelligence during these operations, but was important in many other aspects.

Light armored forces needed air power to maintain air superiority. During Khalkhin Gol and Bagration, air superiority allowed the CMGs to operate freely throughout the operational rear area. Air power also was able to attack operational objectives such as artillery, reserves, C2, and logistics assets in conjunction with the CMGs.

CMGs composed of light armored units were extremely effective against deep operational objectives. The 1st CA gained success by attacking C2, LOCs, and logistics assets which made a severe psychological impact on the Polish forces and commander. At Khalkhin Gol the LOCs and enemy routes of withdrawal were cut. During Bagration, the CMG successfully attacked C2, LOCs, and operational reserves. The CMGs also seized key terrain for river crossings and blocking positions for

operational encirclements. Every operation demonstrated that light armored forces were very effective against deep operational objectives in the enemy rear area.

Light armored forces also displayed the ability to execute several forms of maneuver. The 1st CA was able to conduct a penetration against weak forces, infiltrate portions of its mobile force, and conduct an envelopment of the Polish 3rd Army. At Khalkhin Gol, Zhukov's mobile forces were able to exploit a penetration in the north, find an assailable flank in the south, and conduct a double envelopment. The fast light armored forces of the CMG in Bagration conducted a deep envelopment over a distance of two hundred kilometers. The ability to seize terrain deep in the enemy rear area also demonstrated the CMG's ability to execute a turning movement. The three historical examples clearly demonstrated that light armored forces were capable of conducting limited penetrations, infiltrations, envelopments, and turning movements.

#### Section 5 - Conclusions

The purpose of this study was to determine how can the U.S. Army successfully use light armor in deep operational maneuver at the corps level. This study examined the use of light armor in deep operational maneuver within a theoretical and historical context.

The analysis focused on the areas of: (1) how to organize light armored forces for deep operations, (2) the objectives of light armored forces in deep operations, and (3) the forms of maneuver used by light armored forces in deep operations. The analysis clearly illustrated three conclusions."

First, the light armored force organization for deep operational maneuver should be a combined arms force similar to the CMG concept. The combined arms CMG organization must have fast light armored vehicles, extensive reconnaissance capability, and have organic and joint air power assets. Airpower proved essential to gain and maintain air superiority and to destroy targets in operational depth. The advantages of the CMG organization are that it was light, fast, logistically supportable over long distances, could traverse difficult terrain, and attained all operational objectives. The light armor based CMG could serve as a model for the U.S. Army's mobile strike force (MSF) concept.

The composition of the MSF would consist of a light armored cavalry regiment (LTACR), two light armored brigades, an aviation brigade, and a combat support brigade (See Appendix K). The LTACR could provide reconnaissance, security, and significant destructive firepower capability for offensive operations in

operational depth. The two light armored brigades would be the MSF principle offensive force. Organic attack helicopter and artillery assets would attack deep targets. The airforce would maintain air superiority and also work jointly with the MSF against operational targets.

The light armored MSF must be a balanced force to be perceived as a threat in the rear area. The fast moving MSF would cause the enemy concern in the rear area and force him to fight or withdraw for security. The force must have offensive potential and be strong enough to threaten deep objectives.

Second, a light armored MSF would be effective against deep operational objectives. Historically, light armored forces were extremely effective against C2 structure, LOCs, logistics assets, artillery, operational reserves, and seizing key terrain. The presence and destructiveness of the MSF in the enemy rear will also destroy the morale of the army and the will of the commander. The light armored MSF's thermal acquisition capability and ability to outrange virtually all potential opponents gives the MSF a significant advantage against ground based operational reserves.

Third, a light armored MSF can conduct envelopments, turning movements, infiltrations, and

limited penetrations. If the enemy defense was weak, had open flanks, or was in the process of forming, the MSF would move into the operational rear area independently. The MSF could envelop, infiltrate, conduct a penetration, or combine a series of these maneuvers to advance into and attack objectives in operational depth. The MSF could also seize key terrain as part of a turning movement. If the enemy force is strong in the tactical area of operations, the MSF will need assistance in the initial penetration operation.

The theorists and historical examples suggest that light armor could not conduct frontal attacks or penetrations against a coherent defense. In order to gain access to the operational rear area, a heavy combined arms force must make a penetration for the MSF. The heavy force must create a penetration throughout the tactical depth of the battlefield to enable the MSF to exploit the penetration into operational depth. The MSF would then have freedom of maneuver in pursuit of operational objectives.

The light armored MSF must move deep and as quickly as possible. A disruptive MSF deep in the enemy rear and a heavy force pressuring the enemy in the close operation would place overwhelming operational pressure on the enemy main force. The ultimate result would

place the enemy in a position of disadvantage and threaten the continuing existence of the enemy force.

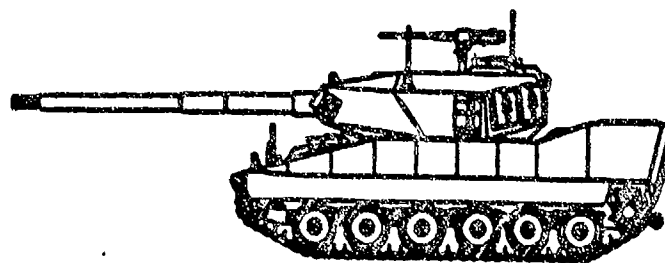
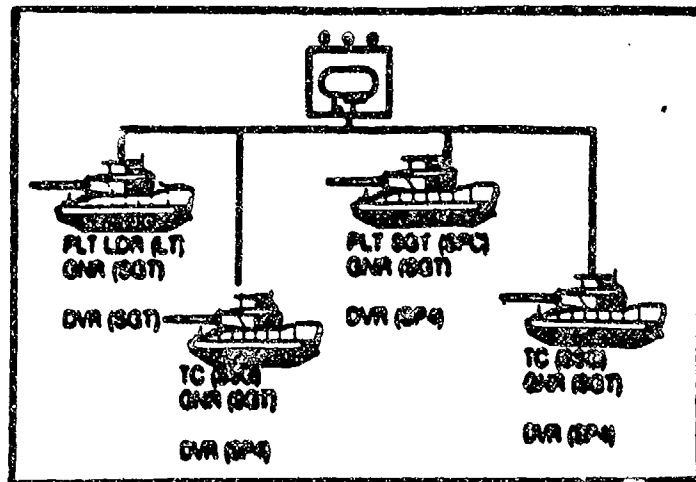
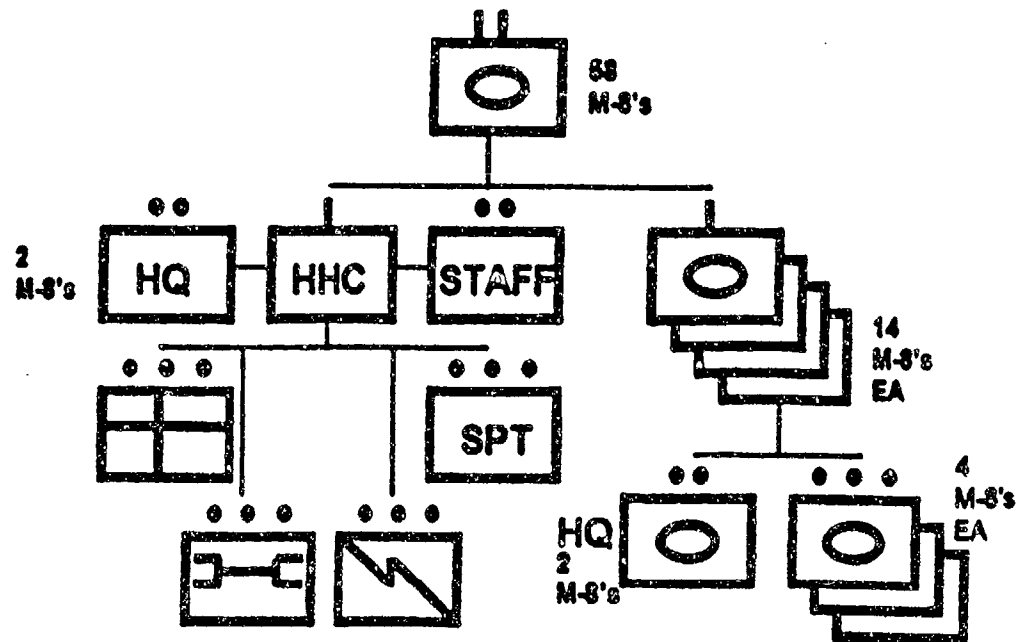
The use of light armored forces in deep operational ground maneuver is of vital importance to the U.S. Army today. Recent operations in the Persian Gulf, existing regional armored threats, and the need for high speed armored formations with deep operational capability make this an urgent issue for the U.S. Army. Light armored units will be among the first units deployed in future regional contingency operations. A light armored MSF can conduct rapid deep operational maneuver before or after the arrival of heavy forces. The U.S. Army can not afford to ignore the advantage of a light armored MSF. Like King Arthur, we were in search of a new Excalibur. Now that we have found Excalibur, we must take the sword and put it to good use.

Merlin and Arthur rode until they came to a lake. An arm arose from the waters holding aloft a sword. Beside the lake was a fair damosel who told Arthur to cross the waters and take Excalibur. With his new sword, King Arthur rode away to perform many legendary deeds of arms.

Sir Thomas Malory<sup>99</sup>

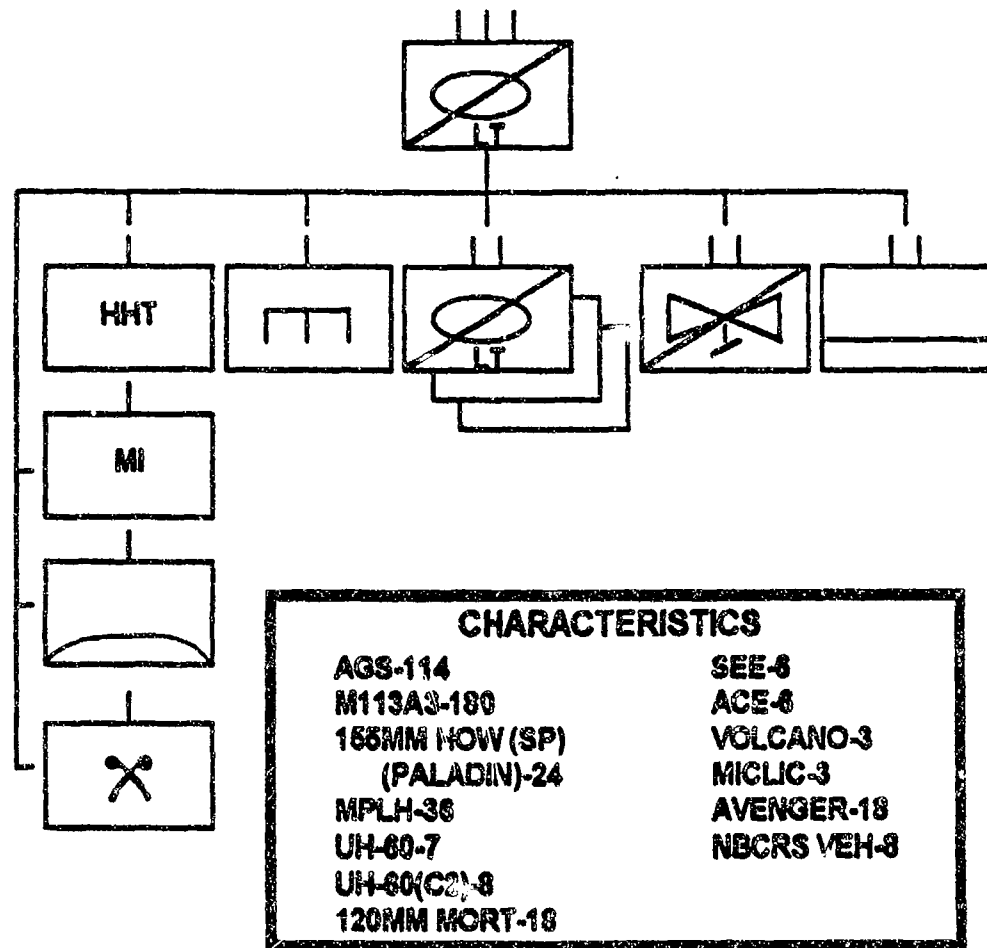
# APPENDIX - A

## Light Armor Battalion Organization\*\*



# APPENDIX - B

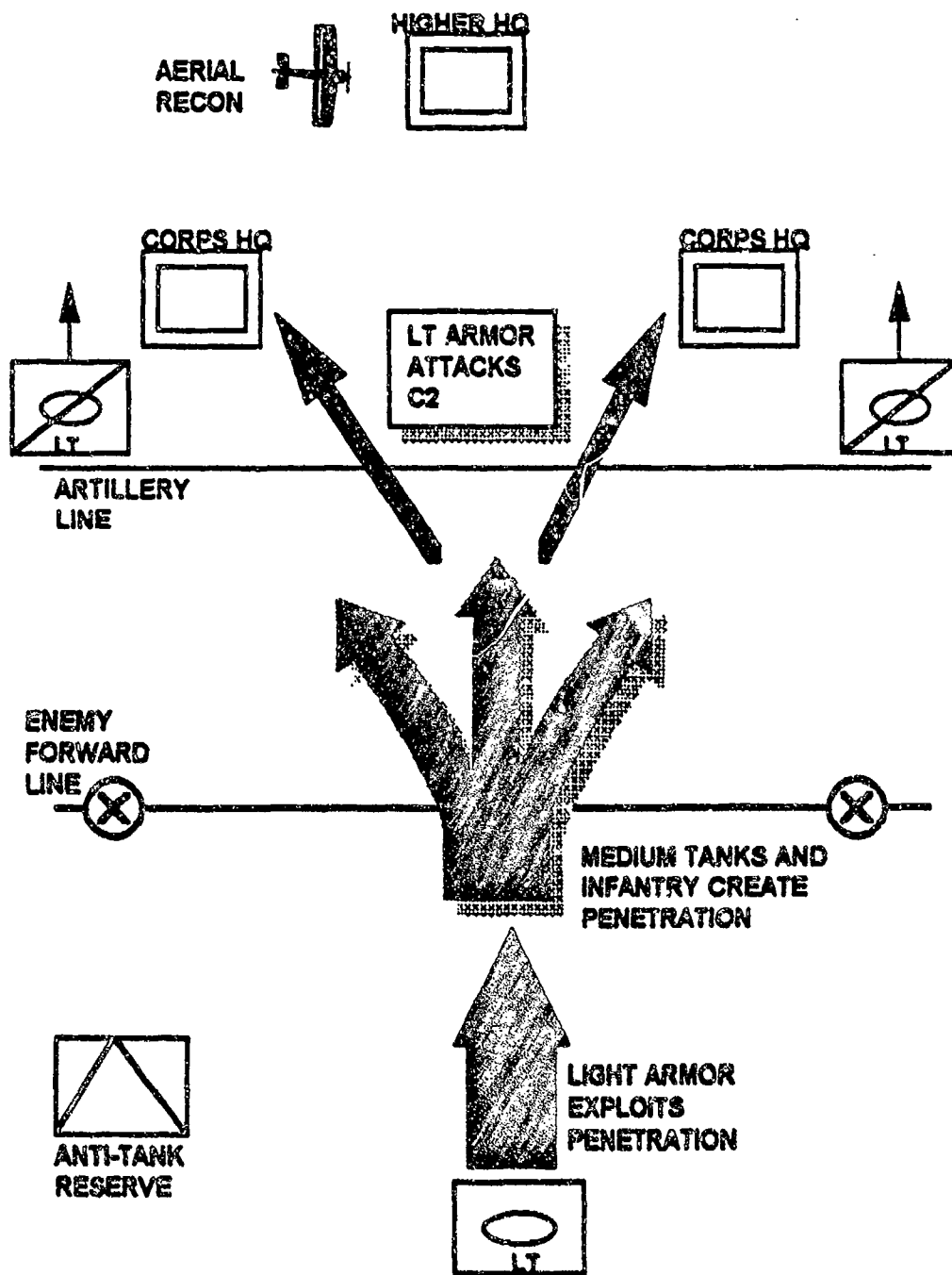
## Light Armored Cavalry Regiment Organization





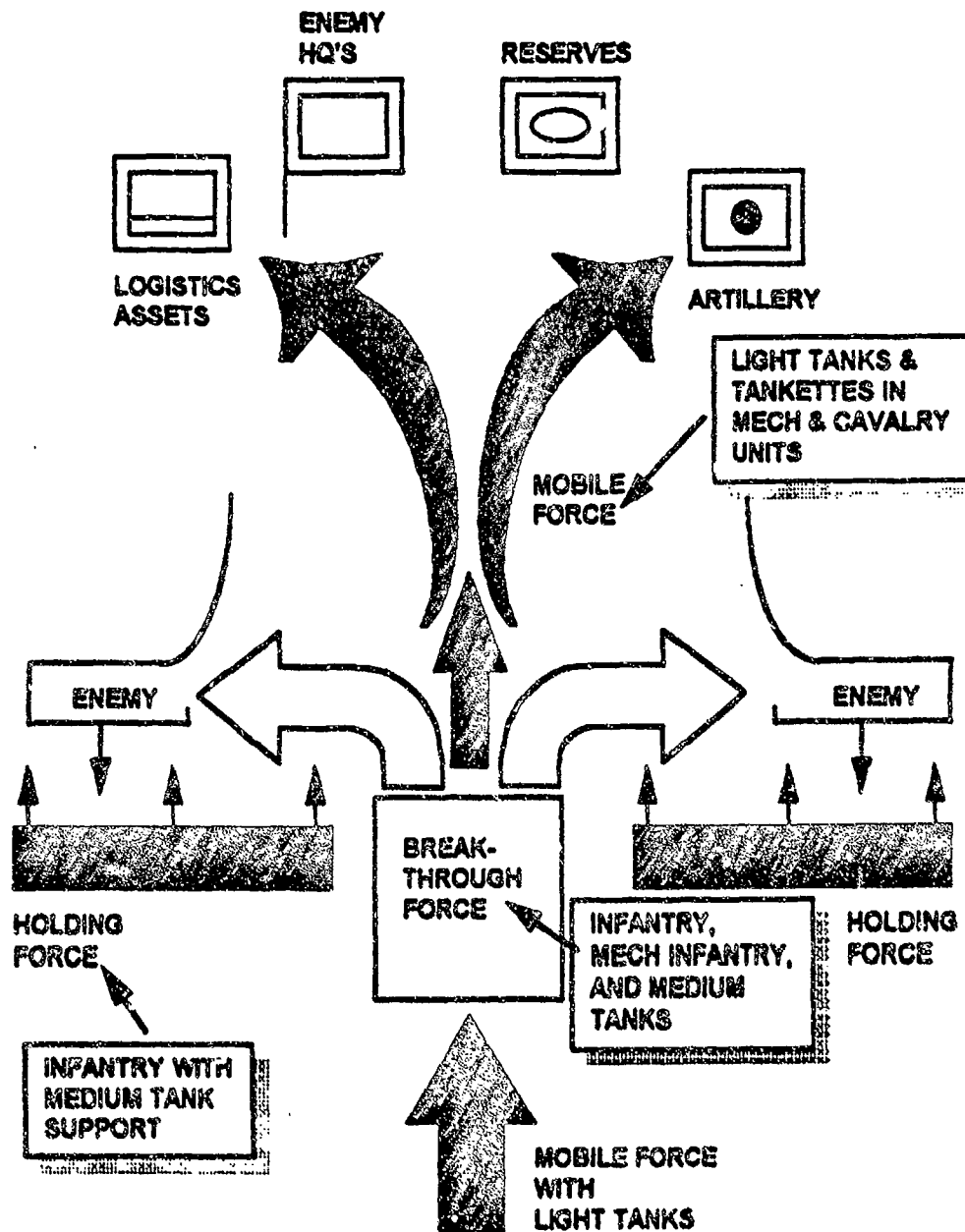
APPENDIX - C

J.F.C. Fuller's Deep Operational Maneuver Concept



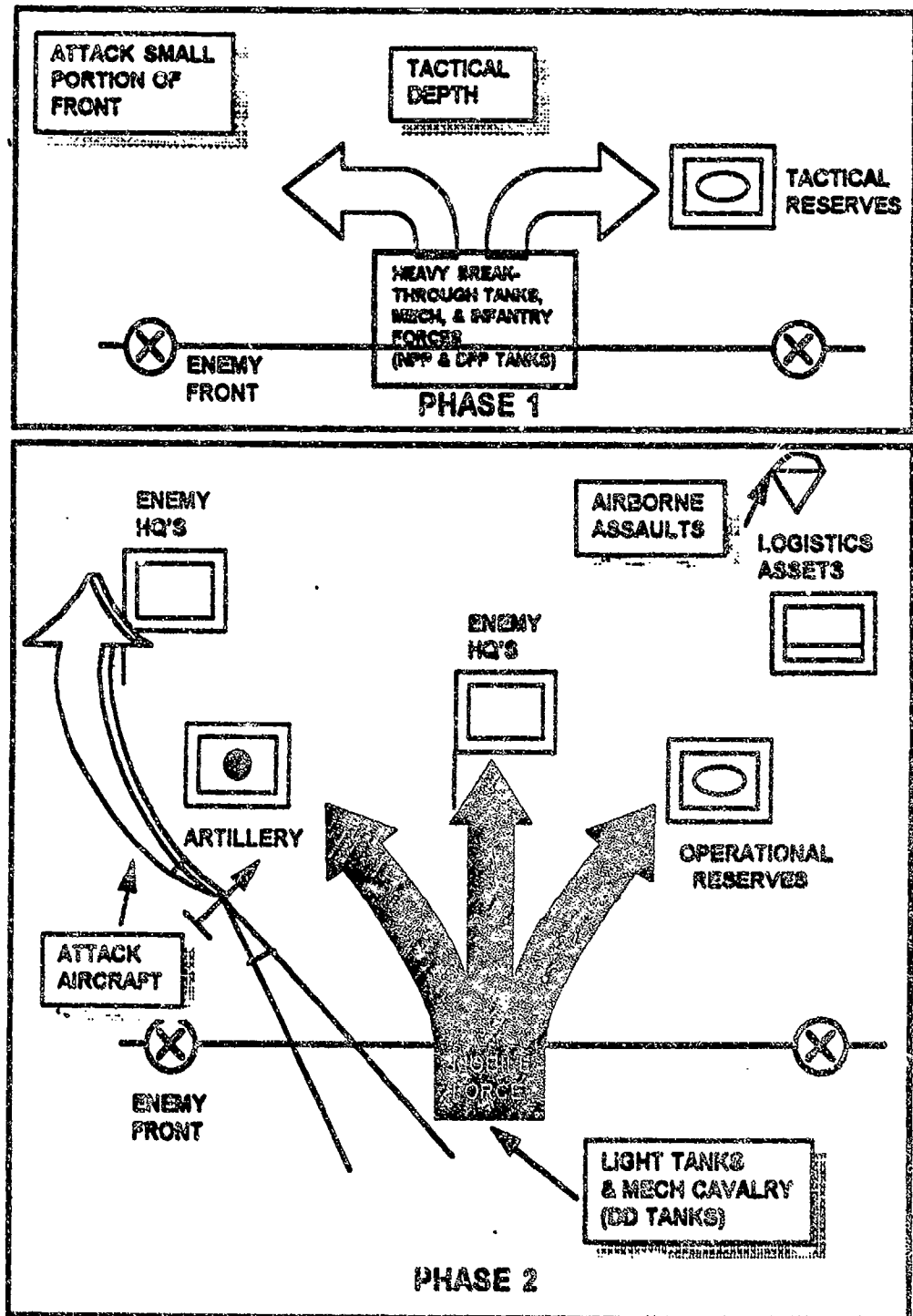
APPENDIX - D

M.N. Tukhachevsky's Deep Operational Maneuver Concept



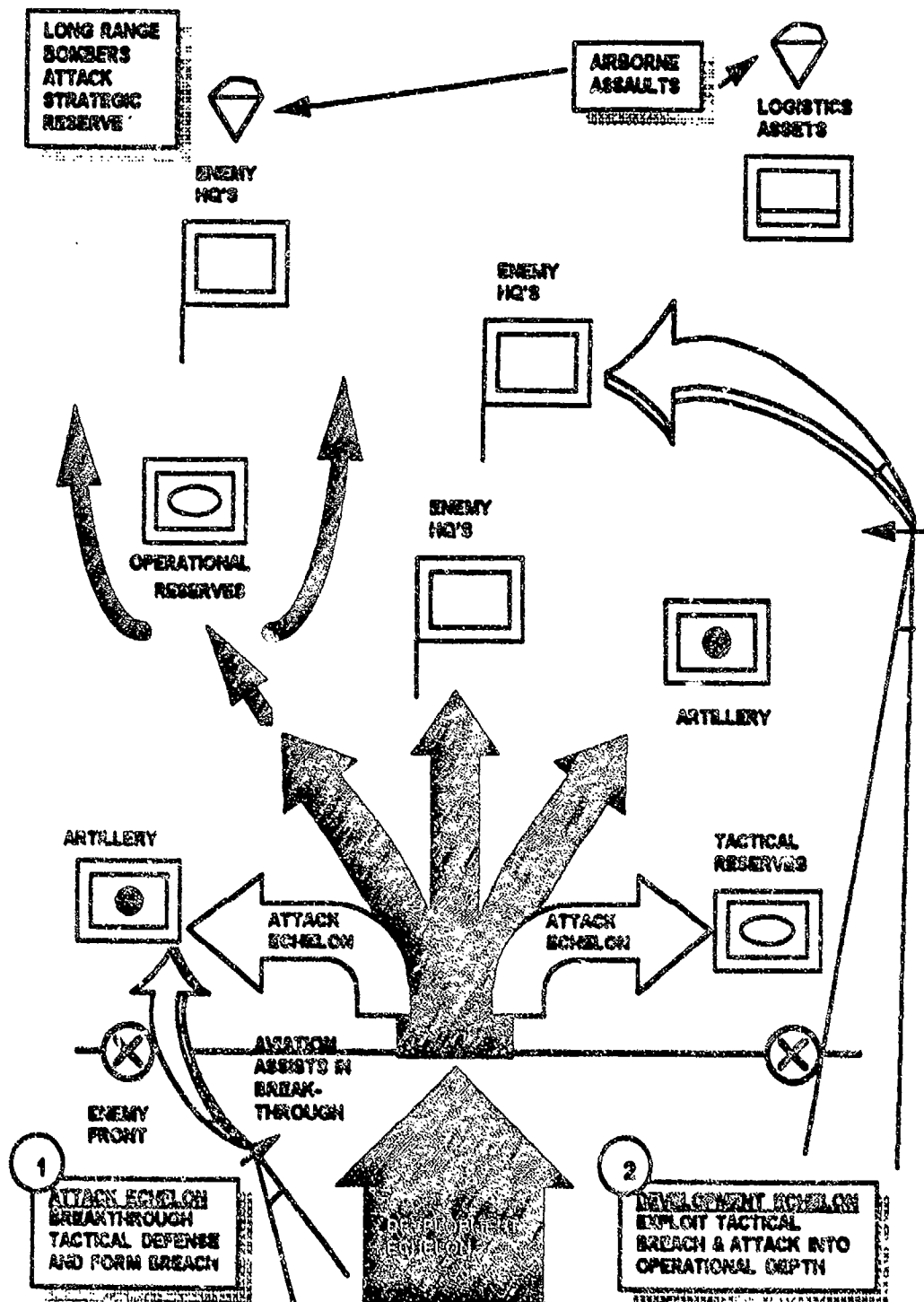
# APPENDIX - E

## V.K. Triandafillov's Deep Operational Maneuver Concept



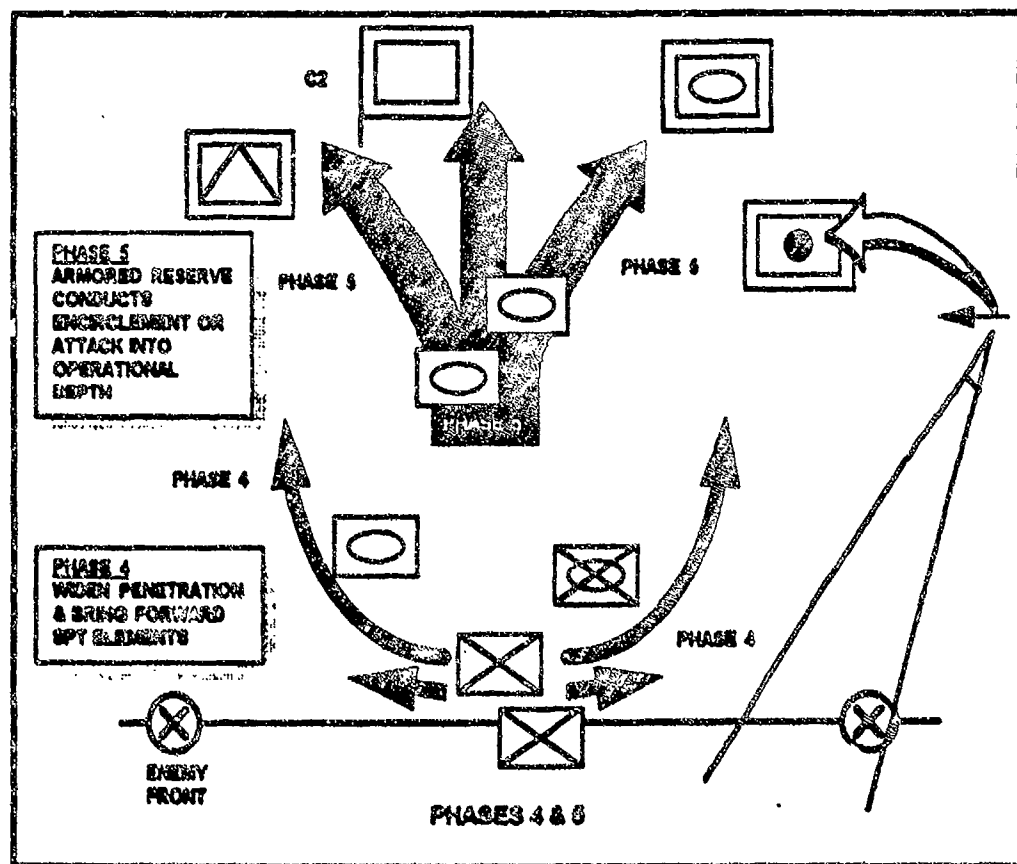
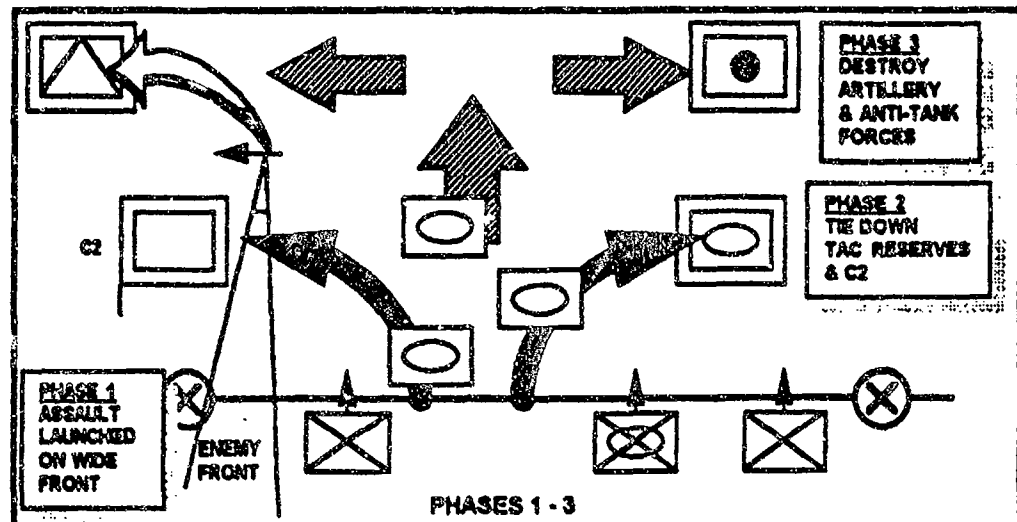
# APPENDIX - F

## G.S. Isserson's Deep Operational Maneuver Concept



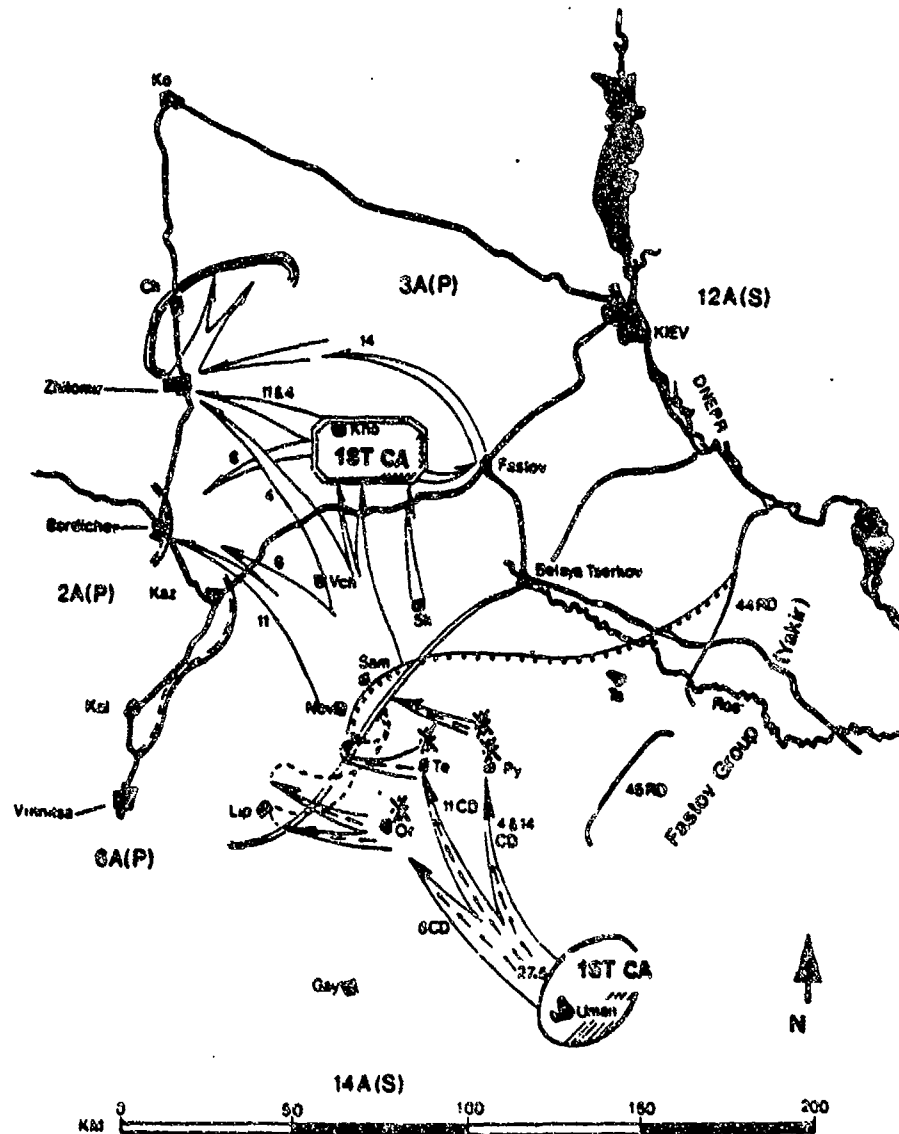
# APPENDIX - G

## Heinz Guderian's Deep Operational Maneuver Concept



### Map of 1st Cavalry Army in the Kiev Operation<sup>20</sup>

### Map of 1st Cavalry Army in the Kiev Operation<sup>20</sup>



## The Kiev Operation, Soviet-Polish War, 1920

- |     |  |     |              |     |               |
|-----|--|-----|--------------|-----|---------------|
| A   | = Army   | Gay | = Gayrin     | Py  | = Pyatigori   |
| (S) | = Soviet   | Kal | = Kalinovka  | Sem | = Samgorodok  |
| (P) | = Polish   | Kaz | = Kazatin    | Sk  | = Skvira      |
| RD  | = Rifle Division                                     | Kho | = Khodokov   | Ta  | = Tarasha     |
| CD  | = Cavalry Division                                   | Ko  | = Korosten   | Te  | = Tetiyev     |
|     | numbers indicate cavalry divisions of 1st Horse Army | Lip | = Lipovets   | Vch | = Vcheraische |
| Ch  | = Chernyakov   | Nov | = Novofastov |     |               |
|     |  | Or  | = Oratavo    |     |               |

# APPENDIX - I

## Map of Khaikhin Gol Campaign<sup>21</sup>

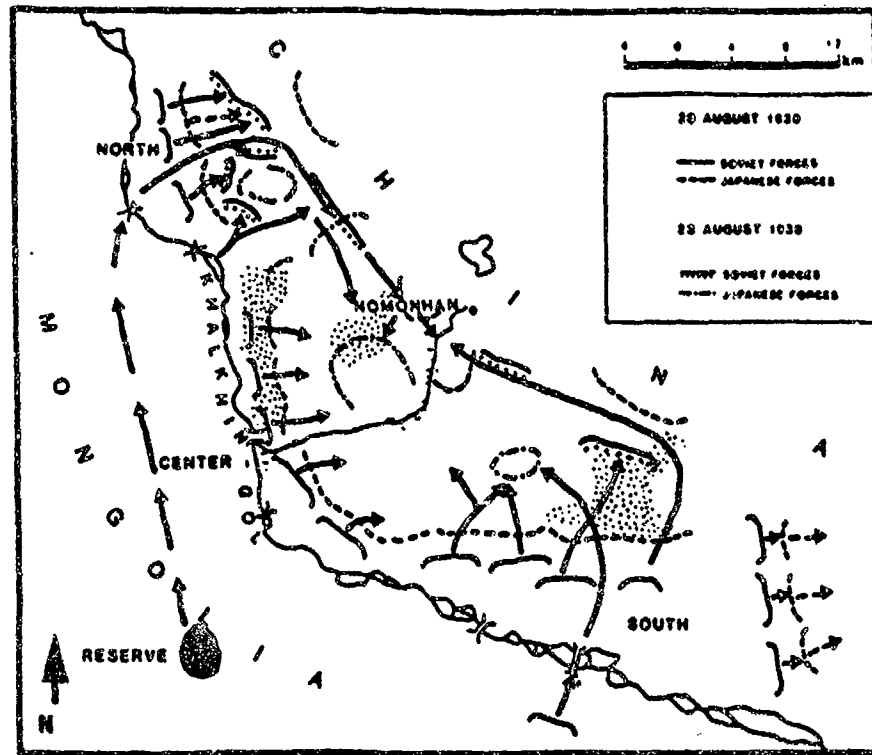


Fig. 1 Combat Actions on the Khaikhin-Gol (20-23 August 1939)

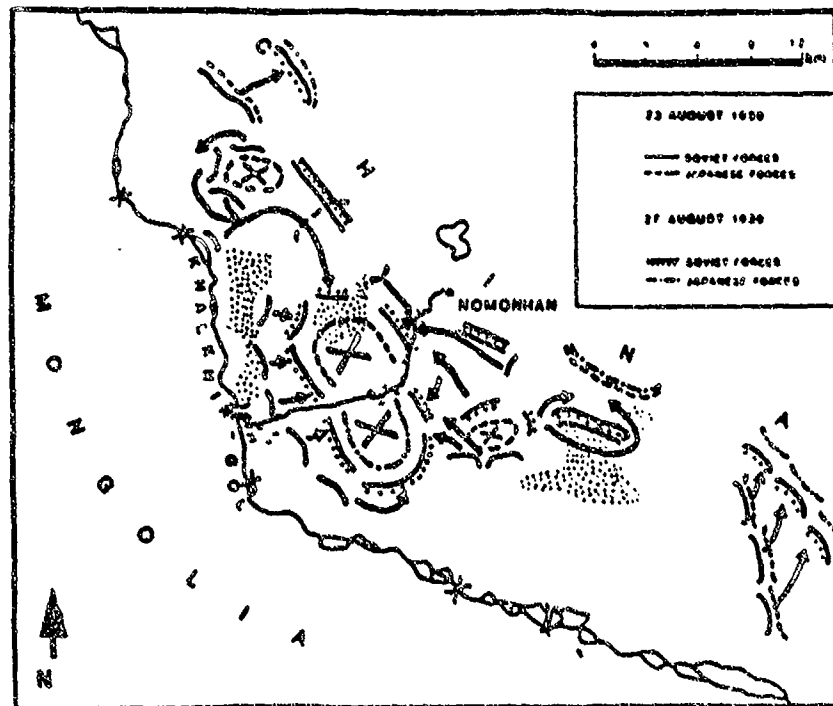
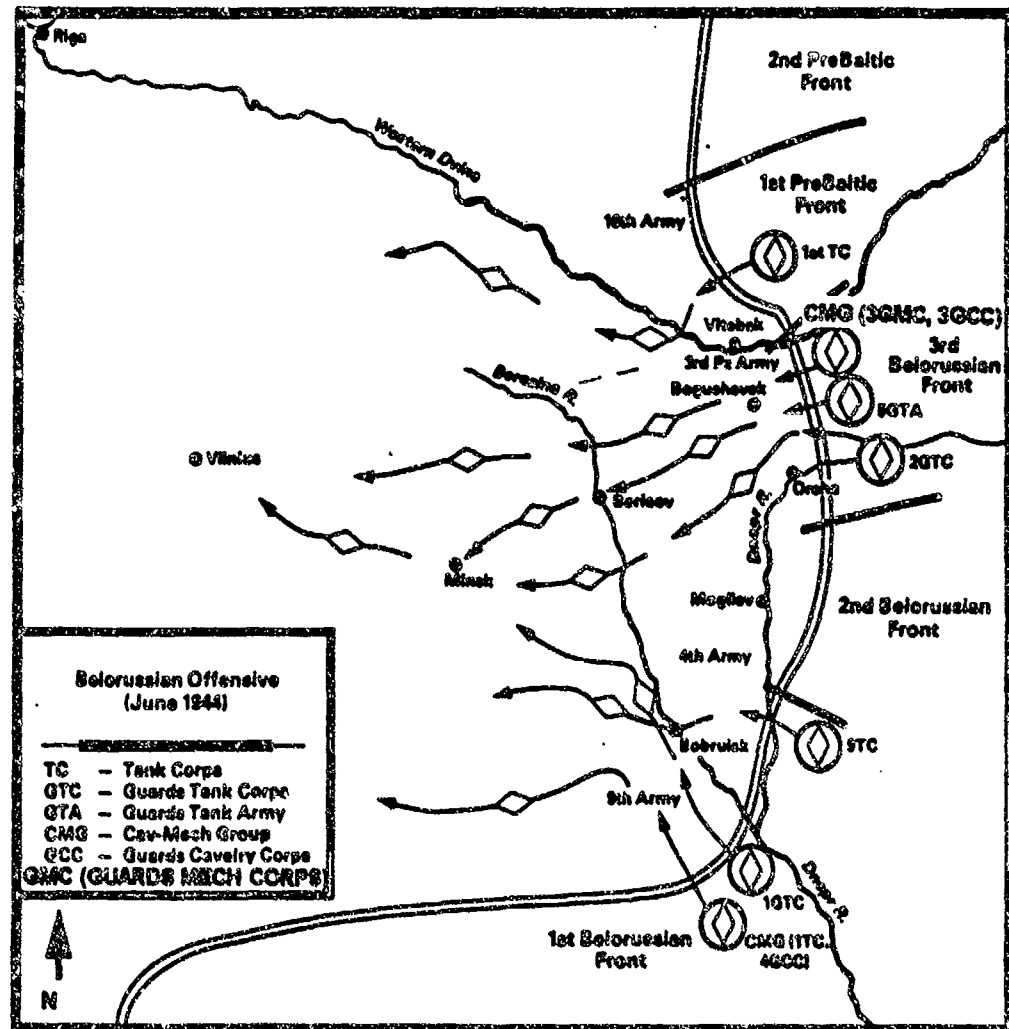


Fig. 2 Combat Actions on the Khaikhin-Gol (23-27 August 1939)



# APPENDIX - J

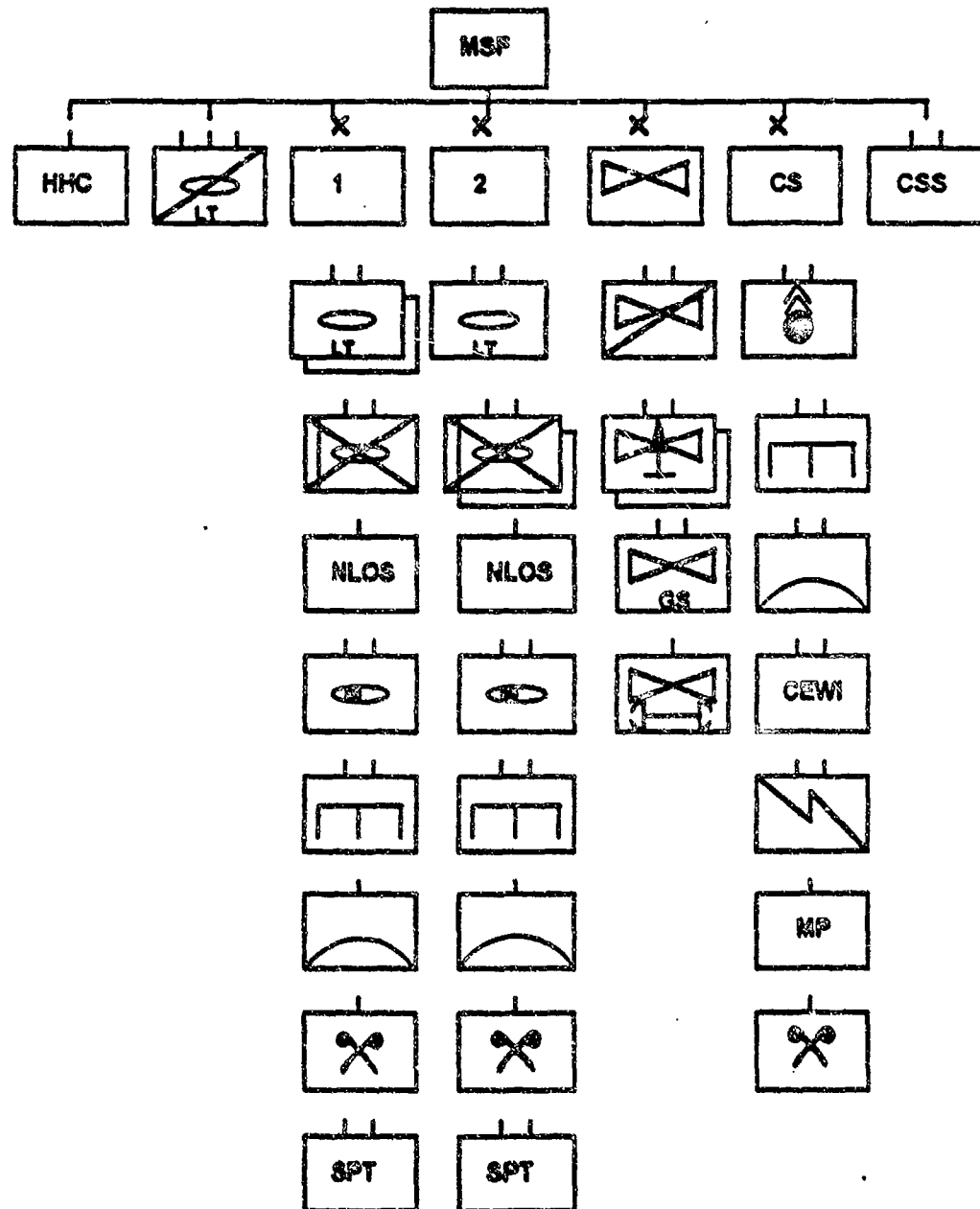
## Map of Operation Bagration<sup>SM</sup>





# APPENDIX - K

## Proposed Mobile Strike Force Organization



## ENDNOTES

1. Thomas Malory, Le Morte D'Arthur, (Norwalk, CT: The Easton Press, 1955), pp. 34-35.
2. "Armored Gun System to give Light Units Antiarmor Punch," Army (July 1987), p. 52.
3. "The Soldier Armed: XM8 Armored Gun System (AGS)," Army (September 1992), p. 57.
4. John A. Nagl, "AGS-Sheridan Replacement Offers Better Firepower Plus World Wide Mobility," Armor (July - August 1992), p. 26.
5. Ibid.
6. "The Soldier Armed: The XM8 AGS", p. 57.
7. Christopher Bellamy, The Future of Land Warfare, (New York: Routledge St. Martin's Press, 1987), p. 197. During Operation Peace For Galilee in June 1982, Israeli tanks armed with 105mm guns, destroyed Syrian T-72's in the Beqa'a Valley at ranges up to 3500 meters. Israeli tanks accounted for 60% of Syrian tanks killed during the operation.
8. "The Soldier Armed: XM8 AGS", p. 57.
9. Ibid.
10. MAJ Lou Dimarco, phone interview by MAJ Alan M. Mosher, 24 September 1993. MAJ Dimarco stated that the current light armor battalion Table of Organization and Equipment (TOE) would have fiftyeight tanks and no mortars or scouts. He is the chief of platoon doctrine in the doctrine division of 2-16th CAV, U.S. Armor Center, Fort Knox, Kentucky.
11. John M. Friedson, "Tactical Logistics Support For The 2nd Armored Cavalry Regiment," (Monograph, SAMS, U.S. CGSC, First Term AY 93 - 94) p. 55. CASCOM briefing to Army Chief of Staff. Light Armored Cavalry Regiment TRADOC recommendation (Objective 1999 Design).
12. "Armored Gun System - Characteristics," Armor (March - April 1992), p. 13.
13. Jon H. Moilanen, "The Light Cavalry Regiment in Contingency Operations," Military Review (October 1992), p. 66. From an article by LTG Charles B.

32. Simpkin, Race To The Swift: Thoughts on Twenty-First Century Warfare, p. 38.
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34. Richard E. Simpkin, Red Armour: An Examination of the Soviet Mobile Force Concept, (McLean, VA: Brassey's Defence Publisher's, 1984), p. 141.
35. James J. Schneider, "V.K. Triandafillov, Military Theorist," The Journal of Soviet Military Studies (September 1988), pp. 287-289.
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40. Simpkin, Red Armour: An Examination of the Soviet Mobile Force Concept, p. 141.
41. Triandafillov, p. 18.
42. Simpkin, Deep Battle: The Brainchild of Marshal Tukhachevsky, pp. 3, 32-33.
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50. Ibid., p. 36.
51. Ibid., p. 25.
52. Heinz Guderian, Achtung - Panzer!: The Development of Armored Forces. Their Tactics. and Operational Potential, Translated by Christopher Duffy, (London: Arms and Armour Press, 1992), pp. 190-195.
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56. Guderian, Achtung Panzer!: The Development of Armoured Forces. Their Tactics. and Operational Potential, pp. 169-170.
57. Kenneth Macksey, Guderian: Creator of the Blitzkrieg, (New York: Stein and Day, 1976), p. 88.
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59. Norman Davies, White Eagle Red Star: The Polish - Soviet War 1919 - 20, (London: Orbis Books Ltd., 1983), p. 116.
60. J.F.C. Fuller, A Military History of the Western World, (New York: Funk and Wagnalls Co. Inc., 1956), p. 344; Gordan A. Grant, Jacob W. Kipp, Charles L. Smith, Ronald J. Wright ed, Historical Analysis of the Use of Mobile Forces by Russia and the USSR, (College Station, TX: Center for Strategic Technology, Texas A&M University, 1985), p. 79; Edgar O'Ballance, The Red Army: A Short History, (New York: Praeger Inc., 1964), p. 78. There appears to be no two sources that agree on the exact figures and composition of the 1st Cavalry Army. These three sources agree closely with each

other in terms of number of divisions, armored cars, armored trains, artillery, airplanes, and total number of men.

61. Davies, p. 123.
62. Bellamy, The Evolution of Modern Land Warfare, p. 151.
63. Ibid., pp. 150-153.
64. Davies, pp. 124-125.
65. O'Ballance, p. 79.
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67. W. Bruce Lincoln, Red Victory: A History of the Russian Civil War, (New York: Simon and Schuster Inc., 1989), p. 411; O'Ballance, p. 79.
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71. Malcolm Mackintosh, Juggernaut: A History of the Soviet Armed Forces, (New York: The Macmillan Co., 1967), pp. 107-108.
72. Grant, p. 133.
73. Ibid., p. 133.
74. Drea, p. 9.
75. Mackintosh, p. 108.
76. "Excerpts on Soviet 1938 - 40 Operations From The History of Warfare, Military Art, and Military Science," The Journal of Slavic Military Studies (March 1993), p. 104.
77. David M. Glantz, "The Motor - Mechanization Program of the Red Army During the Interwar Years," (Soviet Studies Office, U.S.A. Combined Arms Center, March 1990) p. 40.

78. "Action of the Mobile Group of the 5th Tank Army in the Penetration," The Journal of Soviet Military Studies (December 1988), p. 547.

79. COL David M. Glantz, interview by MAJ Alan M. Mosher, 15 December 1993. COL Glantz stated that during Operation Bagration, Soviet cavalry mechanized groups were primarily light armored units. These units were equipped with T-70 and T-80 light tanks and some T-34's; Grant, p. 368.

80. David M. Glantz, "The Belorussian Strategic Operation: 22 June - 13 July 1944," (Foreign Military Studies Office, Combined Arms Command, August 1985) p. 303.

81. Ibid., p. 295.

82. Glantz interview; Grant, p. 368; John Milsom, Russian Tanks 1900 - 1970, (New York: Galahad Books, 1970), pp. 94-95; Although the Russians classified the T-34 as a medium tank, the light version only weighed 26 tons and exerted a ground pressure of 9.1 foot pounds per square inch (psi). The heaviest version of the T-34 weighed 31.5 tons and had a ground pressure of 11.2 psi.

83. Glantz, "The Belorussian Strategic Operation: 22 June - 13 July 1944," pp. 313-315; Grant, p. 371.

84. Glantz, "The Belorussian Strategic Operation: 22 June - 13 July 1944," pp. 316-318.

85. Ibid., pp. 327-330.

86. Grant, p. 372.

87. Ibid., p. 374.

88. There are also possible links to operations other than war (OOTW). OOTW may be the new preconditions for war. The use of light armor within the current U.S. Army combined arms structure, provides a world wide strategic asymmetrical force. One battalion of light armor with special operations forces (SOF) committed early in OOTW may provide enough strategic leverage to save the commitment of a heavy division for a regional contingency. Rapid deployment of light armor and SOF in OOTW may be the Army's future strategic equivalent of the Navy committing an aircraft carrier to demonstrate U.S. resolve and commitment in a particular region.

89. Malory, pp. 36-37.
90. FM 17-18, pp. 4-2 and 6-2.
91. Bellamy, The Evolution of Modern Land Warfare, p. 148.
92. Grant, p. 135-136.
93. Richard Armstrong, "Mobile Groups: Prologue To OMC," Parameters (Summer 1986), p.65.



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